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Citation for published version (APA):

Silva Ribeiro, W., Gronholm, P. C., Silvestre de Paula, C., Scopel Hoffmann, M., Olider Rojas Vistorte, A., Zugman, C., ... Evans-Lacko, S. (Accepted/In press). Development and validation of the Brazilian Portuguese version of the Reported and Intended Behaviour Scale (RIBS-BP). *Stigma and Health*.

Citing this paper

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**Development and validation of the Brazilian Portuguese version of the
Reported and Intended Behaviour Scale (RIBS-BP)**

Short title: Validation of RIBS-BP

Date of submission: 27/08/2019

Abstract

Objectives: To translate and validate the Reported and Intended Behaviour Scale (RIBS) into Brazilian Portuguese.

Methods: A native Brazilian speaker fluent in English translated the RIBS into Brazilian Portuguese. Comprehensibility and face validity were assessed through discussions with mental health professionals and volunteers recruited from the community. Brazilian Portuguese version of the questionnaire was back translated into English by another Brazilian researcher fluent in English and the researcher who developed the original RIBS was consulted to check the adequacy of the questionnaire translation, and approved the final translated version. RIBS-BP was administered to 1357 caregivers from a community-based cohort. Internal consistency and factor loading were assessed through Confirmatory Factor Analysis (CFA). Differential item functioning was examined using Multiple Indicator Multiple Causes for subgroups of gender, socioeconomic status and caregiver education. To assess external validity, we examined whether responses in RIBS-BP varied among these subgroups, considering respondents' previous contact with people with mental illness.

Results: CFA fit indices were good to excellent ($RMSEA = 0.07$ [0.04 – 0.10 90% *CI*]; $CFI = 1.00$; $TLI = 1.00$). All loadings were above 0.4 (0.73 to 0.89), indicating that intended behaviour items are related to the same unidimensional latent factor. In the latent model, higher socioeconomic status was associated with less intended stigma-related behaviour ($\beta=0.20$, $p<0.001$), adjusted for education and gender.

Conclusion: RIBS-BP has good internal consistency, demonstrate measurement invariance among subgroups, and appears to be a valid measure of stigma, representing a suitable tool to assess reported and intended stigma-related behaviours in Brazil.

Key words

Social Stigma, Mental Disorders, Discrimination, Psychometrics, Health Behaviour

1. Introduction

Mental health-related stigma and discrimination are a worldwide concern (Semrau, Evans-Lacko et al. 2015, Stuart 2016). People with mental illness often experience reduced wellbeing and life chances (Gronholm, Henderson et al. 2017), evidenced by how stigma is associated with impaired access to mental health services and physical health care (Clement, Schauman et al. 2015), premature mortality (Laursen, Munk-Olsen et al. 2007, Gissler, Laursen et al. 2013, Thornicroft 2013), victimisation and harassment (Clement, Brohan et al. 2011), and social exclusion and discrimination in settings including education, employment and housing (Lee, Tsang et al. 2009, Suhrcke and de Paz Nieves 2011). Many people describe the consequences of stigma and discrimination as worse than the experience of the mental illness in itself (Thornicroft, Mehta et al. 2016), and stigma is increasingly recognised as a significant public health concern (Link and Phelan 2006, Thornicroft, Evans-Lacko et al. 2014).

Stigma related to mental health is commonly conceptualised as reflecting issues in the domains of knowledge (ignorance), attitudes (prejudice), and behaviour (discrimination) (Thornicroft 2006, Thornicroft, Rose et al. 2007). The behavioural component – that is, discriminatory experiences – is often reported to be the most pertinent issue for people affected by stigma (Thornicroft, Brohan et al. 2009, Evans-Lacko, Rose et al. 2011). Discriminatory behaviour is thus a highly meaningful stigma-outcome, which warrants assessment and monitoring using appropriate and valid instruments.

Despite the importance of assessing behaviour, few instruments have been validated to assess the behavioural construct at the population level in a brief feasible manner. A validated measure that could be administered in a relatively short amount of time would facilitate assessment of trends over time among the general public and evaluation of anti-stigma interventions. The Reported and Intended Behaviour Scale (RIBS) (Evans-Lacko,

Rose et al. 2011) was developed as a brief tool to assess reported and intended behaviour in relation to people with mental health problems among the general public. It comprises eight items across two subscales, on reported and intended behaviours. The measure has moderate test-retest reliability of 0.75, and good internal consistency; $\alpha=0.85$ (Evans-Lacko, Rose et al. 2011). The RIBS was originally developed as an assessment tool for population level anti-stigma campaigns in the UK. It has since been adapted and validated for use in Japanese (Yamaguchi, Koike et al. 2014) and Italian (Pingani, Evans-Lacko et al. 2016) and, and has good internal consistency ($\alpha=0.83$) in both languages. A randomized controlled trial carried out in Japan showed RIBS's potential to identify reduction in mental illness-related stigma as a result of an anti-stigma intervention (Koike, Yamaguchi et al. 2016).

Although research on stigma and discrimination has increased in recent years, there is still limited research in low-and middle-income countries and few validated assessments of stigma, particularly in the behavioural domain (Semrau, Evans-Lacko et al. 2015, Thornicroft, Mehta et al. 2016). In Brazil, evidence suggests that stigmatising attitudes towards people with mental illness are common both amongst the general population (Peluso and Blay 2011, Loch, Wang et al. 2014) and mental health professionals (Ronzani, Higgins-Biddle et al. 2009, Loch, Hengartner et al. 2011). One important obstacle to developing research on stigma in Brazil is the lack of standardized instruments. For example, all seven Brazilian quantitative studies included in a systematic review on stigma in Latin America (Mascayano, Tapia et al. 2016) assessed stigma through questionnaires developed for a given study, which makes it difficult to compare results across studies. Therefore, translations and validations of standardized assessments are needed to further advance research on stigma in the Brazilian context. The aim of this study was to translate and validate the RIBS for use in Brazilian Portuguese (RIBS-BP).

2. Methods

2.1. Design and sample

This validation study is part of a larger study that aims to investigate barriers to mental health care among young people. This study is nested within the Brazilian High-Risk Cohort (HRC) (Salum, Gadelha et al. 2015), which is an ongoing prospective longitudinal study that comprises a community sample of young people from Sao Paulo and Porto Alegre, Brazil, who were six to twelve years old at baseline (2010-2011). The reasons for nesting our study into the HRC are that it had already recruited a robust community sample of young people and included a comprehensive assessment of psychopathology and life events that will enrich the study of barriers to care, including the role of stigma as a major barrier to care. HRC interviews were performed with children and their caregivers (primarily their parents). The latter responded to the RIBS-BP. Of the 2511 caregivers who participated in the HRC baseline, 1952 were randomly selected aiming to obtain a final sample of 1,500 participants. Those who agreed to participate were invited to complete the RIBS-BP as part of the HRC 3-year follow-up phase (2014-2016). RIBS-BP interviews were performed via telephone.

The following sociodemographic characteristics were collected from participating caregivers: gender (female vs. male), age, ethnicity (self-report: white, black, mixed white and black, indigenous, and Asian), education level (in three categories: “no education through to complete primary education”; “secondary education”, and “university level education, including post-graduation”), and socioeconomic status (SES). SES was assessed through the Brazilian Economic Criteria 2009 developed by the Brazilian Association of Research Enterprises, which classifies families into social classes based on their education and purchase power (Associação Brasileira de Empresas de Pesquisa 2010). Based on families’ assets, a score ranging from 0 to 38 is given. An additional score ranging from 0 to 8 is given

based on the head of household's education level, resulting in a total score ranging for 0 to 46. In this study, SES was categorised as “very low/low” (0-13), “medium” (14-22), and “comfortable/high” (23-46).

Only caregivers who were either biological mothers or biological fathers were included in the analysis, as full the full set of data on sociodemographic characteristics that were required for analyses were only available for these respondents (as per the HRC protocol).

2.2. Instrument

The RIBS-BP enquires about caregivers' own experiences/intentions regarding behaviours towards people affected by mental health problems. Specifically, the RIBS comprises eight items across two subscales. Items 1-4 enquire about “reported behaviours” and items 5-8 enquire about “intended behaviours” in relation to living with, working with, living nearby, and friendships with “someone with a mental health problem”. The reported behaviour items have categorical response options (yes, no, don't know), whereas the intended behaviour items have Likert-style response options (agree strongly, agree slightly, neither agree nor disagree, disagree slightly, disagree strongly, don't know).

The “reported behaviour” items assess past and current behaviours and experiences. The responses to these items capture the context within which intended behaviours are reported, and can be used to examine, for example, if a person reports or perceives social contact with people with a mental illness.

The “intended behaviour” subscale items assess intended future behavioural discrimination, and these scores are used to calculate the RIBS total score. This composite score is generated by summing these item responses (agree strongly = 5, agree slightly = 4, disagree slightly = 2, disagree strongly = 1, and both neither agree nor disagree and don't

know = 3; the total score ranges 4-20). *Higher* scores reflect *less* intended stigmatising or discriminatory behaviours towards people with a mental health problem (e.g., stronger agreement with being willing to live nearby/work with someone with a mental health problem).

2.3. Translation process

Based on the World Health Organization's guidelines for the translation and adaptation of instruments (World Health Organization 2016), the following steps were taken to translate the questionnaire items into Brazilian Portuguese. Firstly, a native Brazilian speaker who is also fluent in English translated the RIBS questionnaire into Brazilian Portuguese. Secondly, to assess comprehensibility and face validity, the translated questionnaire items were discussed with mental health professionals and volunteers recruited from the community (through in-depth individual conversations). Thirdly, the Brazilian Portuguese version of the questionnaire was back translated into English by another Brazilian researcher who is also fluent in English. In a final step, the researcher who developed the original RIBS was consulted to check the adequacy of the questionnaire translation, and approved the final translated version. The RIBS-BP is available as Supporting Table 1.

2.4. Statistical Analyses

2.4.1. Descriptive statistics

2.4.1.1. Sample characteristics

Analyses of frequency were performed to describe the sample in terms of the sociodemographic characteristics detailed earlier: gender, age, ethnicity, education level and SES. Age was dichotomised into 25-44 years and 45-69 years. Mean age and standard deviation (SD) were also estimated.

2.4.1.2. RIBS-BP response frequencies

Frequencies of responses to the RIBS-BP variables were described based on the proportion of participants who endorsed each category in the eight items of the scale.

2.4.2. Psychometric analyses

2.4.2.1. Internal consistency and goodness of fit

Cronbach's alpha was used to calculate the internal consistency for the RIBS-BP total score, with 0.6 being used as a cut-off for acceptable internal consistence (Cronbach 1951).

Confirmatory factor analysis (CFA) was performed to assess internal consistency and fit indices for the intended behaviour dimension (i.e., questions 5-8). We used delta parameterization and weighted least square with diagonal weight matrix with standard errors and mean- and variance-adjusted chi-square test statistics (WLSMV) estimators. Model fit parameters were Chi Square Test of model fit, root mean square error of approximation (RMSEA), Comparative Fit Index (CFI) and Tucker Lewis Index (TLI). Values of RMSEA near or below 0.08 represent acceptable model fit, and values lower than 0.06 represent good-to-excellent model fit (Hu and Bentler 1999). CFI and TLI values near or above 0.90 represent acceptable model fit, while values higher than 0.95 represent a good-to-excellent model fit. Factor scores for each factor were saved from the best model.

Factor loadings of the CFA models were also assessed. These factor loadings provide information about how strongly related each item is to the latent trait of stigma, and how well the items discriminate between different severity levels. Category threshold parameters were assessed to examine the approximate severity level (in stigma latent trait units) at which the transition between one response category to the next is likely to happen (e.g., agree strongly to agree slightly).

2.4.2.2. Measurement invariance analysis

To assess whether the psychometric properties of the RIBS-BP scale were constant among subgroups, it was first necessary to investigate whether the scale operates the same way among distinct groups; that is, that there is no evidence of differential item functioning. In order to assess RIBS-BP total score invariance across respondents' gender, education and SES, the influence of these covariates was explored using a "multiple indicators, multiple causes" (MIMIC) model (Brown 2015). To evaluate differential item functioning, a CFA for the RIBS-BP intended behaviour total score model was conducted, followed by adding all covariates (SES correlated with education). A significant effect of the covariate on observed items of RIBS-BP total score would indicate measurement non-invariance (i.e., holding the latent factor constant, the probability of endorsement in the items is different at different category of the covariate), also referred to as differential item functioning.

2.4.2.3. External validity

RIBS-BP validity can also be assessed by examining its relationship with external correlates known to be associated with the latent trait of stigma. Thus, RIBS-BP known-group validity was examined by assessing whether responses varied between different subgroups within the sample: namely, respondents with different levels of education, SES and gender, as past literature reports that levels of stigma can vary based on these characteristics (Rüsch, Evans-Lacko et al. 2012, Evans-Lacko, Malcolm et al. 2013, von dem Knesebeck, Mnich et al. 2013). This was assessed by means of comparing responses on the RIBS-BP intended behaviour subscale items (scores ranging 1-5) and the RIBS-BP total score (scores ranging 4-20) between education level, SES and gender subgroups through Student's t-tests and Mann-Whitney Wilcoxon tests. Chi-squared tests were performed to examine differences between responses (yes, no, don't know) for items on the RIBS-BP reported behaviours subscale by education, SES and gender.

To examine the influence of past social contact with persons with mental illness with the latent construct of stigma, the association between responses regarding past/current reported behaviours (i.e., items 1-4) and the intended behaviour score (i.e., the latent RIBS-BP variable based on items 5-8) was examined through a single structural equation model, inserting one RIBS-BP reported behaviour at a time (univariate regressions), which has the advantage of taking measurement error into account (Brown 2015).

Stata version 13.0 was used to run descriptive analysis. CFA was performed using MPlus 7.4 (Muthén and Muthén 2012).

3. Results

3.1. Translation process

The few inconsistencies identified during the translation process were addressed via consensus meetings. The most significant adaptation was related to the expression “live with” used in questions 1, 5 and 7. In Portuguese it would be literally translated to “vive com”, but the expression “mora com” is more appropriate in Brazilian Portuguese, and therefore was used in the RIBS-BP. RIBS-BP items in Brazilian Portuguese are provided as supplemental material (Supplemental Material S1).

3.2. Descriptive analyses

3.2.1. Sample characteristics

From the initial sample ($n=1952$), 1413 (72.4%) caregivers agreed to participate and met study inclusion criteria. From these 1413 participants, 1370 were mothers or fathers, of whom 1357 answered the RIBS-BP questions and were included in the analyses. The sample was predominantly female, with a mean age of 42.33 years ($SD = 7.33$). Table 1 displays the sample’s sociodemographic characteristics, alongside indicators of education level and SES.

TABLE 1 ABOUT HERE

3.2.2. RIBS-BP response frequencies

Table 2 details the distribution of scores for the RIBS-BP items on the “reported behaviours” and “intended behaviours” subscales. Responses on reported behaviour subscale suggest relatively low contact, varying from 23.3% of respondents who are “currently working, or have ever worked with” to 36.4% who “currently have, or have ever had, a neighbour with mental health problems”. On the RIBS-BP intended behaviour subscale, responses were considerably skewed towards agreement with the intended behaviour items – the proportion of respondents who agreed slightly or agreed strongly with the items were: 60.1% for willingness to live with; 77.8% for being willing to work with; 89.6% for being willing to live nearby; and 93.3% for willingness to continue a relationship with a friend who developed mental health problems.

TABLE 2 ABOUT HERE

3.3. Psychometric analyses

3.3.1. Internal consistency and goodness of fit

Cronbach’s alpha for the intended behaviour subscale total score was 0.75, indicating acceptable level of internal consistency. This level was not improved by removing items from the subscale (Supplemental Material S2), which means that internal consistency was best when all four subscale items were retained.

Fit indices for the confirmatory factor analysis for RIBS-BP intended behaviour model (items 5-8) were good to excellent (RMSEA = 0.07 [0.04 – 0.10 90% CI]; CFI = 1.00; TLI = 1.00), except for chi-square (χ^2 (2) = 13.66, $p=0.001$), which is known to be overly

sensitive to large samples. All factor loadings were above 0.4 (0.73 to 0.89) which indicate that RIBS-BP intended behaviour relate strongly to the latent factor and discriminate well individuals. Factor loadings and thresholds (item difficulty) are depicted in Table 3.

TABLE 3 ABOUT HERE

3.3.2. Measurement invariance analysis/MIMIC

To compare RIBS-BP total score levels between subgroups, evaluation of different item functioning was needed. Under the MIMIC model using gender, SES and caregiver educational level as covariates (Figure 1), none of the intended behaviour items presented different item functioning (no modification indices appeared after the covariates were added to the RIBS-BP intended behaviour model). Fit indices for this model were excellent: $\chi^2 (13) = 37.60, p < 0.001$; $RMSEA = 0.04 (0.02 - 0.05 \text{ 90\% CI})$; $CFI = 0.99$; $TLI = 0.99$.

FIGURE 1 ABOUT HERE

Figure 1: Diagram for the MIMIC model. RIBS-BP intended behavior score model linked by factor loadings in each item and association with correlates. Grey standardized regression coefficients represent non-significance ($p > 0.05$). Note: MIMIC, Multiple Indicators Multiple Causes; SES, socioeconomic status, in which high, medium and low classes are represented as categories, respectively; Education, caregiver educational level measured in three levels (non or primary; secondary; university).

3.3.3. External validity

As there was no differential item functioning (i.e., items worked equally amongst covariate categories), known-group validity could be assessed by examining RIBS-BP factor scores amongst participants with different levels of education and SES; these results are displayed in Table 4. Regarding the reported behaviour subscale, the proportion of respondents who reported working with someone with a mental health problem was significantly higher among participants with university-level (33.6%) than among those with primary (19.2%) and secondary (24.7%) education. The proportion of participants who

currently have, or have ever had, a neighbour with a mental health problem was also significantly higher among participants with university-level (48.6%) versus those with basic (33.5%) and secondary (36.4%) level education. No statistically significant differences were found in relation to socioeconomic status. When comparing mean scores for items on the intended behaviour subscale across education level, participants with secondary education were more willing to work with someone with mental health problems than participants with no/basic education (mean = 4.30 vs. 4.07; $p=0.040$). None of the other between-groups differences were statistically significant. When comparing mean scores across SES, no statistically significant differences were found. In the CFA, however, higher SES was associated with less intended stigma-related behaviour ($\beta=0.20$, $p<0.001$), when adjusted for educational level and gender. Figure 1 shows the latent model using the covariates. We also examined differences in the frequency of RIBS-BP responses scores by gender, but no differences between groups were found (data not shown).

TABLE 4 ABOUT HERE

When RIBS-BP reported-behaviour items were included as regressors on the RIBS-BP intended behaviour latent variable, fit indices were excellent in the factor model. None of reported behaviour items associated with intended behaviour latent factor (data not shown). This might indicate that, in the structural equation model, the reported stigma behaviour does not relate with a subject's intentions towards that behaviour, at least in these cross-sectional data.

4. Discussion

This study aimed to adapt the RIBS questionnaire into Brazilian Portuguese (RIBS-BP) and assess its psychometric properties. The RIBS-BP was shown to be a reliable and valid measure of reported and intended behaviours towards people with mental illness.

The psychometric properties of the RIBS-BP were comprehensively assessed using a range of approaches. The unidimensional model of the RIBS-BP intended behaviour total score was good to excellent, suggesting that the construct of intended stigmatising behaviour was best assessed using the total score building on all four items.

When examining individual items from the RIBS-BP intended behaviour score, responses were skewed towards agreement with the intended behaviour items. This pattern was comparable to the pattern of responses reported in previous studies (Evans-Lacko, Rose et al. 2011, Pingani, Evans-Lacko et al. 2016). As in other studies that used RIBS (Evans-Lacko, Rose et al. 2011, Yamaguchi, Koike et al. 2014, Pingani, Evans-Lacko et al. 2016), the Brazilian sample reported low levels of contact with persons with mental health problems, ranging from 23.2% for “working with” to 36.4% for “having a neighbour with mental health problems”. In our sample levels of reported behaviours also varied across education level, with people with university-level reporting working with and having a neighbour with mental health problems.

In the current study, RIBS-BP was able to distinguish intended behaviour between groups, such individuals with differing education levels and socioeconomic status, comparable to reports in previous literature (von dem Knesebeck, Mnich et al. 2013). In addition to confirming the external validity of the RIBS-BP scale, such insights can also inform future efforts regarding subgroups who might particularly benefit from targeted anti-stigma interventions.

4.1. Strengths and limitations

Some limitations of this study should be considered. First, it was not possible to assess convergent and divergent validity, as no appropriate variables were available for such comparisons. We did, however, examine RIBS-BP scores across different levels of education, SES and gender. These are theoretically meaningful points of comparison, and the scores on RIBS-BP matched the pattern expected based on previous literature, reflecting an assessment of known-groups validity. Additionally, we performed a measurement invariance analysis, which indicated that the RIBS-BP psychometric properties were consistent across different subgroups. It was also not possible to examine test-retest reliability. It is thus recommended that future studies would assess also this aspect of reliability in relation to the RIBS-BP. In our translation process, we were not able to carry out a structured pilot study. However, we assessed comprehensibility and face validity by discussing the RIBS-BP items with mental health professionals and volunteers from the community, whose feedback showed that our version of the questionnaire was adequate to be applied in the Brazilian context. We do believe that additional formative phases of qualitative work would have strengthened our understanding of the cultural underpinnings of stigma in Brazil, and we recommend future studies on stigma should include a qualitative component to understand cultural aspects that may influence stigmatising attitudes in the local context. Although we applied the RIBS-BP to a large community sample the majority of participants were females, who traditionally are the main caregivers in Brazil. Due to the overrepresentation of female participants, estimates of levels of stigma in our sample may be biased as the literature suggests that females, compared to men, often have more positive views and lower levels of stigmatizing attitudes and intended behaviours (Evans-Lacko, Malcolm et al. 2013, Coates, Saleeba et al. 2018, Mukherjee and Mukhopadhyay 2018, Reavley, Morgan et al. 2018). Despite this limitation our sample size was robust, and the sample was considerably diverse as far as other

sociodemographic characteristics are concerned, such as education and SES, allowing us to assess psychometric properties through a variety of robust statistical methods.

The findings of this study need to also be considered in view of potential social desirability bias in responding, which can be an issue in non-anonymous data collection and when assessing sensitive outcomes like stigma. In view of this, these data might represent a conservative estimate of stigmatising behaviours within the surveyed population.

Finally, it needs to be noted that the RIBS, and thus also RIBS-BP, assesses behaviours via self-report. It is possible that these data concerning reported and intended behaviours do not fully capture behaviours as exhibited in practice. Nonetheless, the RIBS constitutes a more feasible means to assess behaviour than for example observational research methods, thus allowing the assessment of the discriminatory element of stigma; a key dimension that remains under-researched in the stigma literature.

4.2. Conclusion

We conducted a comprehensive assessment of the psychometric properties of the RIBS-BP. Our findings indicated that RIBS-BP is comprehensible among the Brazilian community-based sample this study considered, and has good face validity, good internal consistency, and was shown to be a valid measure of stigma amongst members of the Brazilian public. Thus, RIBS-BP is a brief and suitable self-report tool suitable for use in population surveys to assess reported and intended stigmatising behaviours in the social and cultural Brazilian context.

Figure Legends:

Figure 1: Diagram for the MIMIC model. RIBS-BP intended behavior score model linked by factor loadings in each item and association with correlates. Grey standardized regression coefficients represent non-significance ($p > 0.05$). Note: MIMIC, Multiple Indicators Multiple Causes; SES, socioeconomic status, in which high, medium and low classes are represented as categories, respectively; Education, caregiver educational level measured in three levels (non or primary; secondary; university).

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List of supporting Information

1. Supporting Table S1: Brazilian version of the Reported and Intended Behaviour Scale
(RIBS-BP)

Supporting Table S2: Internal consistency of the RIBS-BP